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3         upon loading of the class that has the empty initialization function by the
4         task, creating the task class mirror object that holds the task private representation
5         of the class;

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6        setting the task class mirror object's state to fully initialized; and

7        assigning the task class mirror object's pointer to the initialized entry of  
8        the task class mirror table associated with the class for that task.

1           33.     An apparatus to efficiently realize class initialization barriers in a  
2     multitasking virtual machine, wherein class loading always takes place before  
3     class initialization, and wherein a class initialization barrier guarantees that a class  
4     is initialized before the class is first used by a program, comprising:

5 an associating mechanism that is configured to associated a shared runtime  
6 representation of the class with a task class mirror table that comprises at least one  
7 entry per-task, including an initialized entry, for a plurality of tasks, wherein each  
8 entry holds either a null pointer value or a non-null pointer to a task class mirror  
9 object, wherein all entries of a task mirror table that hold a non-null pointer value  
10 and that are associated with a same task hold a pointer to a same task class mirror  
11 object, wherein the task class mirror object holds a task private representation of  
12 the class for that task;

13           a determining mechanism that is configured to use the initialized entry of a  
14   task in the task class mirror table to determine whether this task has initialized the  
15   class associated with the task class mirror table; and

16            an accessing mechanism that is configured to access the task class mirror  
17    object associated to a particular task.

1            34.    The apparatus of claim 33,

1            35.    The apparatus of claim 34, further comprising:

2           a creating mechanism that is configured to create the task class mirror  
3   table and associating the task class mirror table with the shared runtime  
4   representation of the class upon creation of the shared runtime representation of  
5   the class; and

6       a setting mechanism that is configured to set all entries of the task class  
7       mirror table to the null pointer value.

1            36.    The apparatus of claim 35, further comprising:

an examining mechanism that is configured to examine the initialized entry of the task in the task class mirror table associated with the class in order to determine if that task has initialized the class, wherein the byte-offset to the initialized entry from the beginning of the task class mirror table is obtained from the descriptor of a thread performing an examination on behalf of the task; and

an initializing mechanism that is configured to initialize the class by the task if the class is not already initialized, wherein a null pointer stored at the initialized entry indicates that the class has not initialized the task.

1            37.    The apparatus of claim 36,

wherein the setting mechanism is further configured to set the initialized entry of the task class mirror table associated with the class to the task class mirror object that holds a representation of the class that is private to the task; and

wherein the setting mechanism is further configured to set this task class mirror object to a fully initialized state.

38. The apparatus of claim 37, wherein task class mirror tables associated with classes that have a non-empty initialization function includes one resolved entry per-task in addition to one initialized entry per-task, for the plurality of tasks.

39. The apparatus of claim 38, wherein task class mirror tables associated with classes that have an empty initialization function includes one resolved entry per-task in addition to an initialized entry per-task, for the plurality of tasks.

40. The apparatus of claim 39,  
wherein the creating mechanism is further configured to create the task  
class mirror object that holds the task private representation of the class;  
wherein the setting mechanism is further configured to set the task class  
mirror object's state to loaded; and  
further comprising an assigning mechanism that is configured to assign the  
task class mirror object's pointer to a resolved entry of the task class mirror table  
associated with the class for that task.

41. The apparatus of claim 40,  
wherein the task class mirror table is arranged so that the resolved entry